

# Limits of Detection - Alloys

Thermo Scientific Niton XL2 Plus XRF Analyser

## Low limits, high standards

### Elemental limits of detection

The Thermo Scientific™ Niton™ XL2 Plus handheld XRF analyser is built for your most demanding applications. When low detection limits and high sample throughput is critical, the Niton XL2 Plus' combination of hardware and software provides you with solutions designed to meet your most difficult analytical requirements.

The chart below details the typical sensitivity, or limits of detection (LODs)<sup>1</sup>, of the Niton XL2 Plus in parts per million (PPM) for various elements in aluminum (Al), titanium (Ti), iron (Fe) and copper (Cu) base metals. LODs are calculated as three standard deviations (99.7% confidence interval) for each element using a 60 second analysis time per filter (120 seconds total analysis time).



Limits of Detection in ppm (mg/kg)				
Time: 60s per filter				
Element	Al base metal	Ti base metal	Fe base metal	Cu base metal
Bi	20	40	50	65
Pb	20	40	30	70
W	70	150	275	160
Sb	40	75	80	110
Sn	25	60	70	100
Pd	20	25	45	65
Ru	20	50	70	80
Mo	N/A	A/S	A/S	A/S
Nb	40	100	150	150
Zr	30	40	70	70
Se	N/A	30	40	50
Zn	30	60	80	350
Cu	40	110	150	N/A
Ni	80	175	275	150
Co	60	130	950	140
Fe	110	250	N/A	150
Mn	150	300	300	180
Cr	330	700	110	150
V	750	2600	175	225
Ti	1500	N/A	250	400
S	N/A	N/A	75	N/A
P	N/A	N/A	210	200
Si	400	650	300	350
Al	N/A	3500	2000	2500
Mg	3500	N/A	N/A	N/A

Limits of detection (LODs) are dependent on the following factors:

- Testing time
- Interferences/matrix
- Level of statistical confidence
- Line overlaps

Please note:

Ongoing research and development in our Niton XL2 Plus analysers will lead to continual improvement in many of the values detailed in this chart. Contact Niton UK for the latest performance specifications.

Actual analysis time is based on your requirements. In most cases, shorter times will provide you with the detection limits required. For example, if analysis time is reduced from 60 seconds per filter to 15 seconds per filter, then the detection limits obtained would be twice the values shown in the chart. Similarly, increasing the time of analysis will reduce the detection limits by the square root of the increased time.

<sup>1</sup> Definition and Procedure for the Determination of the Method of Detection Limit, 40 CFR, Part 136, Appendix B. Revision 1.11 U.S. Environmental Protection Agency. U.S. Government Printing Office, Washington, DC, 1995.

Values detailed above are preliminary and subject to change.

A/S= Application Specific N/A = Not Applicable

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